Sacramento Municipal Utility District (SMUD)

Barriers and Solutions to Developing Bioenery in California

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SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT
The Power To Do More.℠

SMUD Biomass Program

- Contributes to SMUD's renewable energy goal & reduce greenhouse gases
- SMUD's Biomass Program - local benefits by turning problem wastes (resources) into renewable electricity
- Supporting policies - Biomass (Retail) Net Metering Rate

Examples of program:

- "Leftovers to Lights" Program focused on diverting food waste from landfills into local projects
- Dairy Digester Incentive Program funds local dairies installing digesters to produce sustainable energy

Biomass Resources, Opportunities, Risks

- Great biomass resources:
  - forestry wood waste, municipal solid waste, manure
  - 6th largest economy in world, strong environmental leadership
- Great opportunities in bioenergy:
  - Can easily make targeted 20% of CA renewable electricity
  - Huge impacts on greenhouse gas reduction
- Great risk if we don't use these resources:
  - Climate change impacts our economy, our safety, enjoyment of our environment, and our long term viability
  - Drought, forest fires, flooding, sea level rise, heat waves, blackouts, inflation from reliance on fossil fuel supply

Barriers and Solutions

- Regulatory hurdles & business as usual market barriers
  - Biomass projects most complex renewable energy source
  - Requires multiple permits; air, water, solid waste
  - Produce many un-monetized external benefits
  - Produce many cross agency impacts – good and bad
- Barriers to implementing projects:
  - Regulatory silos, usually focused on controlling a single element despite existence of cross agency benefits
- Solutions
  - Create mechanisms that recognize the cross agency benefits
  - Recognize that tradeoffs exist – there is no free lunch!

Barriers & Solutions to Onsite Generation-Dairies

Benefits

- Distributed electric generation benefits:
  - Only largest dairies can clean up gas to pipeline specs
  - Electric power produced where it is needed without new transmission, line losses
  - When using waste heat, more efficient than central plants

Barriers

- Cannot meet central plant emission levels
  - Lacks cost-effective or proven low emission engine technology
  - Lacks cost-effective or proven gas cleanup technology

Barriers & Solutions to Onsite Generation-Dairies

Solutions

- Policies that credit projects with **net benefit** exchange between NOx and Greenhouse gas emissions
- Funding for RD&D on technology improvements to reduce emissions
- Flexible permitting using proven technologies available at reasonable cost while progress is made

Tradeoff

- If 50% of CA dairies adopted digester technology:
  - NOx emission would be about 998 tons with lean burn engine technology and no oxidation catalyst (1 g/bhpr)
  - Greenhouse gas reduction benefit at 4.4 million tons

Barriers and Solutions to Codigestion

Benefits

- Food waste in landfills can cause water and air quality impacts
- On-farm codigestion provides good resource for energy and soil nutrients – 20%% food waste can double energy production

Barriers

- Elemental salts in manure and in food waste are retained during codigestion
- Study of salt management only beginning, standards not yet established

Barriers and Solutions to Codigestion

Solutions

- Support Salinity Working Group in developing guidelines for salt application rates to farmland
- Support research on manure management with codigestion and desalinization

Tradeoff

- Codigestion can provide farmers with revenue that supports digester projects without government funding.
- Codigestion adds to complexity of nutrient management

Barriers and Solutions to MSW Conversion

Barriers

- Even after AB939, we dispose 46 million tons/year in landfills
- Regulations not current with technology - gasification defined as zero oxygen or air and zero emissions to air or water

Solutions

- Legislative action to correct definition of conversion technology
- Support for demonstrations, possibly using fees from landfill

Tradeoff

- Some emissions will result from conversion technologies
- Getting organics out of landfills will protect water and reduce fugitive greenhouse gas emissions